

Customer No.: 31561
Docket No.: 13689-US-PA
Application No.: 10/711,674

REMARKS

Present Status of the Application

The Office Action rejected all presently-pending claims 1-28. Specifically, the Office Action rejected claims 1-5, 8-14, 17-28 under 35 U.S.C. 102(e), as being anticipated by Lei (U.S. 2004/0166661). The Office Action also rejected claims 6-7, 15-16 under 35 U.S.C. 103(a) as being unpatentable over Lei.

Applicants have amended claims 1, 6-7, 10, 15-16, 21 to improve clarity. In particular, the limitations of claims 6-7, 15-16 are described in paragraphs [41-42], and no new matter is entered. After entry of the foregoing amendments, claims 1-28 remain pending in the present application, and reconsideration of those claims is respectfully requested.

Discussion of Office Action Rejections

Applicants respectfully traverse the 102(e) rejection of claims 1-5, 8-14, 17-28 because Lei (U.S. 2004/0166661) does not teach every element recited in these claims.

In order to properly anticipate Applicants' claimed invention under 35 U.S.C 102, each and every element of claim in issue must be found, "either expressly or inherently described, in a single prior art reference". "The identical invention must be shown in as complete details as is contained in the claim. Richardson v. Suzuki Motor Co., 868 F. 2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989)." See M.P.E.P. 2131, 8th ed., 2001.

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The present invention is in general related a bonding pad and a chip structure as claims 1, 10,

21 recite:

Claim 1. A bonding pad for disposing on a chip, comprising:
a body having a first surface and a corresponding second surface and *having a central region and corner regions*, wherein the body is disposed on the chip, and the second surface of the body is in contact with the chip; and
at least one first protruding portion disposed on the first surface at the corner regions of the body.

Claim 10. A chip structure, comprising:
a chip having an active surface;
at least one bonding pad disposed on the active surface of the chip, the bonding pad including:
a body having a first surface and a corresponding second surface and *having a central region and corner regions*, wherein the body is disposed on the chip, and the second surface of the body is in contact with the chip; and
at least one first protruding portion disposed on the first surface at the corner regions of the body.

Claim 21. A pad for disposing on a chip, comprising:
a body *having a central region and corner regions*; and
at least one first protruding portion disposed on corner regions of the body.

Lei fails to disclose, teach or suggest that the first protruding portion is disposed at the corner regions of the body. In Lei's reference, as shown in Fig. 1F, a chip bonding pad 12 is formed on a metallization layer 10. A first UBM system including one or more UMB layers, at least a lowermost layer of titanium 16A, is disposed over the bonding pad 12. In addition, a second UBM system 16B is disposed over the first UBM system 16A. In other words, the first UBM system 16A is formed over the whole bonding pad 12, and the second UBM system 16B is

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formed on the first UBM system 16A and disposed over the whole bonding pad 12. However, in claims 1, 10 and 21, the bonding pad comprises a body and a first protruding portion at the corners of the body. Because first protruding portion is formed at the corners of the body, the corner regions of the bonding pad are strengthened to prevent possible damage to the bonding pad resulting from thermal stress when the chip is bonded to other devices.

Therefore, Lei fails to teach or suggest that the first protruding portion is disposed at the corner regions of the body as claims 1, 10 and 21 recite. Thus, Lei does not teach every element recited in these claims. For at least the foregoing reasons, Applicant respectfully submits that independent claims 1, 10, 21, 23 patently define over the prior art references, and should be allowed. For at least the same reasons, dependent claims 2-5, 8-9, 11-14, 17-20, 22, 24-28 patently define over the prior art as well.

Applicants respectfully traverse the rejection of claims 6-7, 15-16 under 103(a) as being unpatentable over Lei because a prima facie case of obviousness has not been established by the Office Action.

To establish a prima facie case of obviousness under 35 U.S.C. 103(a), each of three requirements must be met. First, the reference or references, taken alone or combined, must teach or suggest each and every element in the claims. Second, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skilled in the art, to combine the references in a manner resulting in the claimed

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invention. Third, a reasonable expectation of success must exist. Moreover, each of the three requirements must "be found in the prior art, and not be based on applicant's disclosure." See M.P.E.P. 2143, 8th ed., February 2003.

Applicants submit that, as disclosed above, Lei fail to teach or suggest each and every element of claims 1, 10, from which claims 6-7, 15-16 depend. Because independent claim 1, 10 are allowable over the prior art of record, its dependent claims 6-7, 15-16 are allowable as a matter of law, for at least the reason that these dependent claims contain all features of their respective independent claims 1, 10. In particular, in Lei's reference, the material for the bonding pad 12 is Al or Cu described at paragraph [0015]. The material for the first UBM system 16A includes a single layer of Ti or multiple layers such as Ti-Ni or Cr-Cu described at paragraph [0017]. The second UBM system 16B includes a first layer of Ti and an uppermost layer of Cu, Ni, Au or Al, and the second UBM system 16B can be layers of Cr-Cu, TiW-Cu or Ni-Cu described at paragraph [0018]. Hence, Lei does not disclose that the materials for the body, the first protruding portion and the second protruding portion are identical as claims 6, 15 recite and the materials for the body and the first protruding portion are identical as claims 7, 16 recite.

CONCLUSION

For at least the foregoing reasons, it is believed that the pending claims 1-28 are in proper condition for allowance. If the Examiner believes that a telephone conference would expedite

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the examination of the above-identified patent application, the Examiner is invited to call the undersigned.

Respectfully submitted,

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